REMARKS

This responds to the Office Action dated January 22, 2007. Claims 1, 17, 18, 34, 51 and 52 are amended, no claims are canceled, and claims 53-54 are added. Thus, claims 1-52 remain pending in this application.

The amendments to the claims are asserted to be supported by the originally-filed application (e.g. page 1 lines 14-21, page 2 lines 3, 22-24, page 6 lines 4-15, page 7 lines 5-7, page 13 line 19 ff). Thus, Applicant asserts no new matter is added.

Telephone Interview

At Applicant's request, Examiner Manuel and Applicant's representative conducted a brief telephone interview on March 21, 2007 to discuss the §101 rejection. Applicant did not argue for the allowance of any particular claim during the interview, but rather requested clarification of the §101 rejection. Applicant thanks the Examiner for his efforts in advancing the prosecution of this application by clarifying the position of the Office regarding §101.

§101 Rejection of the Claims

Claims 1-52 were rejected under 35 U.S.C. § 101. Applicant has amended the claims in to further clarify the recited subject matter. Applicant respectfully submits that the claims produce a useful, concrete, tangible result. Any one of a variety of signals that is characterized by a continuous stream or train, has impulse-like spikes, and where it is of interest to adaptively preserve signal morphology while removing noise can benefit from the smoothing scheme of the present invention. (Application, p. 7 lines, 4-7). Additionally, the smoothing scheme can be used to facilitate identification and/or monitoring morphology devices or methods by functioning, for example, as a preprocessing stage for morphology-dependent schemes. (Application, p. 14, lines 6-9). Applicant respectfully asserts that the amended claims further clarify this useful, concrete and tangible result.

A process claim that applies a mathematical algorithm to "produce a useful, concrete, tangible result without pre-empting other uses of the mathematical principle, on its face comfortably falls within the scope of § 101,"" *AT&T Corp. v. Excel Communications, Inc.*, 172

F.3d 1352, 1358, 50 USPQ2d 1447, 1452 (Fed. Cir. 1999). A process satisfies §101 when a claimed process transforms data from one form to another to produce a number which has specific meaning - a useful, concrete, tangible result - not a mathematical abstraction. *Arrhythmia Research Tech. Inc. v. Corazonix Corp.* , 958 F.2d 1053, 1060, 22 USPQ2d 1033, 1039 (Fed. Cir. 1992) (where Arrhythmia's process claims included various mathematical formulae to analyze electrocardiograph signals to determine a cardiac event for diagnosis.)

Applicant respectfully requests consideration of the claims, and withdrawal of the rejection. Should the Examiner have any concerns that have not been addressed by this response, Applicant respectfully requests the Examiner's assistance in advancing prosecution of this application by calling Applicant's representative to discuss.

§102 Rejection of the Claims

Claims 1, 4-6, 17-19, 32, 33 and 51 were rejected under 35 U.S.C. § 102(b) as being anticipated by Ota (U.S. Patent No. 4,120,229). Applicant respectfully traverses.

Applicant submits Office Action mischaracterizes the Ota reference as providing an output signal representative of a filtered version of an input signal. (Office Action: page 4). The Ota reference provides, an output indicating the ratio between a musical sound and a reference oscillator (Ota: col. 2, lines 53-54; 57-58; 61-63; col. 4, lines 48-52), Therefore, Applicant is unable to find in the Ota reference an output signal representative of a filtered version of the input signal.

The Ota reference illustrates a modified phase lock loop circuit (Ota, 3 in FIG. 4) which generates an error signal indicating the phase ratio between a selected frequency and an input signal. (Ota, col. 4., lines 24-52). Applicant notes the reference, as illustrated in FIG. 4, shows a VCO and shaping circuit connected between the output of a set of filters and one input of a set of phase comparators. The phase comparators are also connected to the input signal to provide a phase comparison of the input signal to a selected shaped output of a VCO. (Ota, 27 in FIG. 2).

With respect to independent claim 1, Applicant is unable to find, among other things, in Ota, a method including comparing the plurality of filtered signal portions to the portion of the input signal to generate a plurality of deviations. Additionally, Applicant is unable to find in Ota a method including comparing one or more of the plurality of deviations to a maximum deviation

limitation to select one of the plurality of filtered signal portions, the selected one filtered signal portion having a deviation less than the maximum deviation limitation. Furthermore, Applicant is unable to find in Ota a method including generating an output signal representative of a smoothed version of the input signal from a combination of a plurality of successive selected one filtered signal portions which substantially preserve the desired waveform with the spikes while substantially removing the noise component. Applicant also cannot find a method that includes outputting the substantially-preserved desired waveform with the spikes for analysis.

With respect to independent claim 17, Applicant is unable to find, among other things, in Ota, a method including determining a desired filtering level from a number of filtering levels for each of the discrete samples of the input signal. Additionally, Applicant is unable to find in Ota a method including determining a desired smoothed signal representative of the desired waveform from a number of smoothed signals corresponding to the desired filtering level, wherein the desired smoothed signal is calculated from a selection of equations including:

$$y_0(n) = x(n),$$

$$y_1(n) = \frac{1}{2}\sum_{m=-1}^{0} x(n+m),$$

$$y_2(n) = \frac{1}{4}\sum_{m=-2}^{1} x(n+m),$$

$$y_3(n) = \frac{1}{8}\sum_{m=-4}^{3} x(n+m),$$ and

$$y_4(n) = \frac{1}{16}\sum_{m=-8}^{7} x(n+m).$$

Furthermore, Applicant cannot find a method that includes analyzing the desired smoothed signal representative of the desired waveform.1

With respect to independent claim 18, Applicant is unable to find, among other things, in Ota, a system including a processor to produce a plurality of filtered signal portions of varying smoothness from the portion of the input signal. Additionally, Applicant is unable to find in Ota, among other things, a system including a processor to determine a plurality of deviations between the plurality of filtered signal portions and the portion of the input signal. Also,

Applicant is unable to find in Ota, among other things, a system including a processor to compare one or more of the plurality of deviations to a maximum deviation limitation to select one of the plurality of filtered signal portions, the selected one filtered signal portion having a deviation less than the maximum deviation limitation. Furthermore, Applicant is unable to find in Ota, among other things, a system including a processor to generate an output signal representative of a smoothed version of the input signal from a combination of a plurality of successive selected one filtered signal portions which substantially preserve the waveform with the spikes while substantially removing the noise component. Applicant is also unable to find a system including a processor to output the substantially-preserved desired waveform with the spikes for analysis.

With respect to independent claim 51, Applicant is unable to find, among other things, in Ota, a system including a processor to receive the input signal and generate an output signal representative of a filtered version of the input signal by adaptively removing noise components from the input signal, wherein: the input signal includes a number of discrete samples; the processor is configured to determine a desired filtering level for each of the discrete samples of the input signal; the processor is configured to determine a desired smoothed signal from a number of smoothed signals corresponding to the desired filtering level; and the desired smoothed signal is calculated from a selection of equations including:

$$y_0(n) = x(n),$$

$$y_1(n) = \frac{1}{2}\sum_{m=-1}^{0} x(n+m),$$

$$y_2(n) = \frac{1}{4}\sum_{m=-2}^{1} x(n+m),$$

$$y_3(n) = \frac{1}{8}\sum_{m=-4}^{3} x(n+m),$$ and

$$y_4(n) = \frac{1}{16}\sum_{m=-8}^{7} x(n+m).$$

Applicant is further unable to find a system that includes processor configured to present the substantially-preserved desired waveform with the spikes for analysis.

The dependent claims are believed to be in condition for allowance for at least the reasons asserted with respect to their independent base claims. Applicant respectfully requests withdrawal of the §102 rejection, and reconsideration and allowance of the claims.

CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney (612) 373-6960 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being filed using the USPTO's electronic filing system EFS-Web, and is addressed to: Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 9 day of April 2007.

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Name Signature